

DATE: December 3, 2020
TO: Career Education Deans and Chief Instructional Officers
San Diego and Imperial Counties Community Colleges
CC: CEOs, CSSOs
FROM: San Diego-Imperial Regional Consortium

**Regional Strong Workforce Program (SWP) Request for Applications (RFA):
Priority and Emerging Sector Strategies**

Please review this RFA carefully before completing the *Letter of Intent* and *RFA Response Form* below. The RFA Response Form will be used to develop the scope of work for the contract with your college *after* a consultation meeting with the Regional Consortium. (More information about this meeting is provided in the RFA Process and Timeline below.) The information submitted in the RFA Response Form will also be used to populate the SWP workplan in the statewide system [NOVA](#).

If you have questions about the scope of this RFA, please contact Mollie Smith at mollie.smith@gcccd.edu or Danene Brown at Danene.Brown@gcccd.edu.

Table of Contents

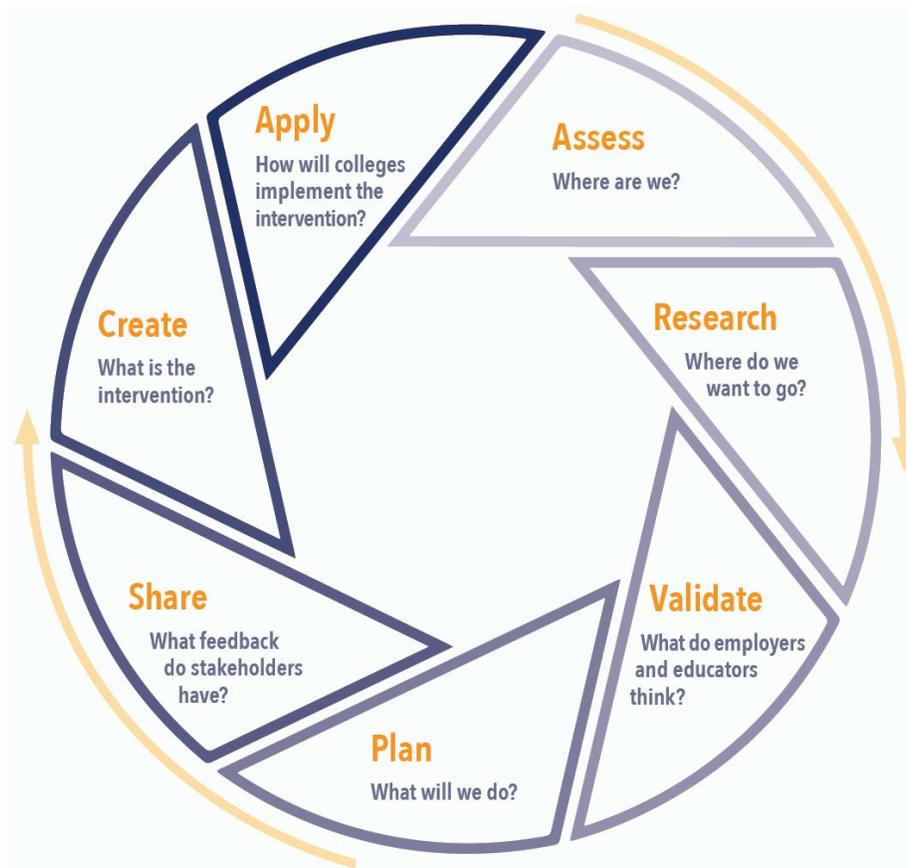
| | |
|---|----|
| Section I: Introduction and RFA Purpose..... | 3 |
| Section II: Sector Strategies and Curriculum Alignment | 4 |
| Section III: RFA Process and Timeline | 6 |
| Section IV: Letter of Intent..... | 9 |
| Section V: RFA Response Form..... | 11 |
| Attachment A: Problem Statements and Possible Interventions (Sector Strategies)..... | 16 |
| 1) Health | 16 |
| 2) Advanced Manufacturing | 20 |
| 3) ICT & Digital Media..... | 24 |
| 4) Business and Entrepreneurship..... | 27 |
| 5) Life Sciences-Biotechnology | 30 |
| Attachment B: Assessment/Analysis of Enrollment, Retention, Completion, Employment and Earnings of Students in Programs (Template) | 34 |

Section I: Introduction and RFA Purpose

This RFA specifically addresses labor market needs in our region’s Priority and Emerging Sectors. The purpose of this RFA is to fund projects or interventions that 1) respond to regional employers’ workforce needs, 2) are supported by data and research, 3) aim to improve specific SWP outcomes or metrics, and 4) have a sustainability plan that examines the efficacy of the intervention and viability of implementing future improvements.

The Regional Consortium advises the San Diego and Imperial Counties Community Colleges to take into consideration the following continuous improvement model when applying for regional SWP funds and implementing their projects or interventions.

San Diego-Imperial Regional Consortium Continuous Improvement Model



Section II: Sector Strategies and Curriculum Alignment

[Attachment A](#) of this RFA details some of the sector strategies that the San Diego and Imperial Counties Community Colleges could implement to address regional labor market needs. These sector strategies (i.e., problem statements and possible interventions) were crafted by the San Diego-Imperial Center of Excellence for Labor Market Research (COE) and the sectors' respective Regional Directors for Employer Engagement. In *Section IV: Letter of Intent* of this RFA, colleges are to select at least one of the sectors in Attachment A to provide an intervention or project for.

We anticipate to have six sector strategies offered by the end of 2020—some are still under development. This RFA will be amended with revisions to Attachment A as sector strategies become available.

Curriculum Alignment Requirement

The first step in implementing sector strategies is to complete the curriculum alignment process. The primary goals of curriculum alignment are to:

1. Align curriculum with the knowledge, skills, and abilities (KSAs) that employers need for targeted occupation(s)
2. Improve retention, success and completion of students in identified career pathway(s)
3. Scale institutional practices that improve equity for all students in the programs of study

All colleges must demonstrate that their curriculum is in alignment with the sector's KSAs before implementing a project or intervention. KSAs are provided for each sector in Attachment A. If the curriculum is not aligned, then the college must conduct a curriculum alignment project. The following steps outline the curriculum alignment process:

1. Create an inventory of all courses in the designated program. The inventory should delineate certificate and degree programs, courses, articulation agreements, and careers.
2. Realign programs to industry needs.
 - a. Identify redundancies to streamline curriculum.
 - b. Update curriculum to align with industry KSAs presented in this RFA.
 - c. Intentionally embed the 21st Century Employability Skills specified as important by employers.
 - d. Clarify stackability or design stackable credentials for the career pathway(s).
 - e. Create a career pathway diagram to include courses, certificates, degree, occupations and certifications.
3. Mitigate disproportionate impact across diverse student populations.

- a. Conduct an assessment/analysis of the enrollment, retention, completion, employment, and earnings of these courses/programs (see Attachment B for template).
 - b. Use disaggregated data to analyze disproportionate impact in the classes based on college service area demographics and student performance. Analyze enrollment, course retention and success, program completion, employment and wage gain.
 - c. Embed strategies into the instructional delivery model of the designated courses to improve retention, success and completion.
4. Integrate work-based learning.
 - a. In collaboration with Work-based Learning Coordinators, integrate a continuum of work-based learning into the instructional delivery model of all courses in the program(s).
5. Implement strategies for improving course retention and success in classes with below-average retention and success rates.

Section III: RFA Process and Timeline

This section outlines the RFA process, including key milestones and timeline. While the timeline below is optimal, there are opportunities to apply for funding after these timelines as funds are available.

Milestone 1: Attend an RFA informational meeting with the Regional Consortium

After carefully reviewing the contents of this RFA, prepare questions to ask at the **RFA informational meeting**, which will be held at 11 a.m. to 12:30 p.m. on Tuesday, October 6, 2020 on Zoom:

Zoom link: <https://cccconfer.zoom.us/j/96603112440>

Call-in number: (669) 900-6833

Meeting ID: 966 0311 2440

Each institution must send **one** representative (instructional dean, associate dean, or vice president) to this meeting.

Milestone 2: Complete *Section IV: Letter of Intent* and submit it to the Regional Consortium

After attending the RFA informational meeting with the Regional Consortium, complete *Section IV: Letter of Intent* and submit it to the Regional Consortium. The letter of intent will represent your institution's intent to respond to this RFA. The letter of intent requires that colleges submit a problem statement and the project description. *Attachment A: Problem Statements and Possible Interventions* has been included in this RFA to assist the colleges with completing the letter of intent. A separate letter of intent must be submitted for *each* proposed intervention or project.

Once "intent" has been established, the Regional Consortium will schedule a project/intervention consultation meeting with your college. Before the scope of work can be finalized, all institutions interested in responding to this RFA **must have at least one project/intervention consultation meeting with the Regional Consortium.**

Milestone 3: Attend project/intervention consultation meeting(s) with the Regional Consortium and discuss *Section V: RFA Response Form*

The Regional Consortium will schedule a project/intervention consultation meeting with your college after receiving *Section IV: Letter of Intent*. At the initial project/intervention consultation meeting, the Regional Consortium will discuss with the college the specifics of *Section V: RFA Response Form*. It is recommended that the colleges have a draft RFA Response Form ready for the initial consultation meeting, so that the Regional Consortium could determine if revisions to your draft RFA Response Form(s) are necessary before finalizing the scope of work. The initial

consultation meeting will determine the extent of the revisions and if another meeting is necessary. The Regional Consortium will also discuss what deliverables must be submitted and how funding will be distributed (i.e., funding model). Please be aware that this will be an iterative process as it is customized to each college's intervention or project. Consultation meetings with the Regional Consortium are intended to be collaborative.

The purpose of the consultation meetings is to confirm that the intervention supports the goal of this RFA, which is to fund projects or interventions that 1) respond to regional employers' workforce needs, 2) are supported by data and research, 3) aim to improve specific SWP outcomes or metrics, and 4) have a sustainability plan that examines the efficacy of the intervention and viability of implementing future improvements.

Milestone 4: Submit final draft of RFA Response Form to the Regional Consortium

After completing the consultation meeting(s) with the Regional Consortium, a final draft of *Section V: RFA Response Form* will be completed. The Regional Consortium and the college should have met and finalized the following:

1. Scope of work of the contract based on the RFA Response Form
2. Total funding amount for the project(s) or intervention(s)
3. Deliverables that the college must submit to receive payments
4. Payment schedule and distribution amounts based on the deliverables' due dates
5. Quarterly progress report contents (e.g., what information should be included in NOVA's quarterly report to demonstrate the intervention's progress)

Milestone 5: Execute contract with Regional Consortium and submit quarterly reports

After the Regional Consortium receives the final draft of the RFA Response Form, an award letter will be sent to your institution, followed by a contract, which includes the scope of work, deliverables, etc. as discussed in the project/intervention consultation meeting(s). The period of performance of the contract will begin on January 1, 2021.

Once your institution and the Regional Consortium execute the contract, the Regional Consortium will make payments based on the agreed upon payment schedule from the consultation meeting(s).

The Regional Consortium expects timely reports to be submitted in NOVA, containing the information as discussed in the consultation meeting(s).

Timeline

| Milestone | Date(s) |
|--|---------------------------------------|
| Attend an RFA informational meeting with the Regional Consortium | October 6, 2020 |
| Complete <i>Section IV: Letter of Intent</i> and submit it to the Regional Consortium | Final Deadline is January 13, 2021 |
| Attend project/intervention consultation meeting(s) with the Regional Consortium and discuss <i>Section V: RFA Response Form</i> | Rolling |
| Submit final draft of <i>Section V: RFA Response Form</i> to the Regional Consortium | January 31, 2021 |
| Execute contract with Regional Consortium | Beginning January 1, 2021 and rolling |
| Submit progress reports for the duration of the project | Quarterly |

Section IV: Letter of Intent

Instructions: Fill in the fields below with the appropriate information. This form represents your college's intent to respond to this RFA. **Please fill out a separate letter of intent for each sector intervention you plan to implement, if you choose to address more than one problem statement.**

| | |
|-----------------------------------|--|
| Institution Name | |
| Project Lead (First & Last Names) | |
| Project Lead Email | |

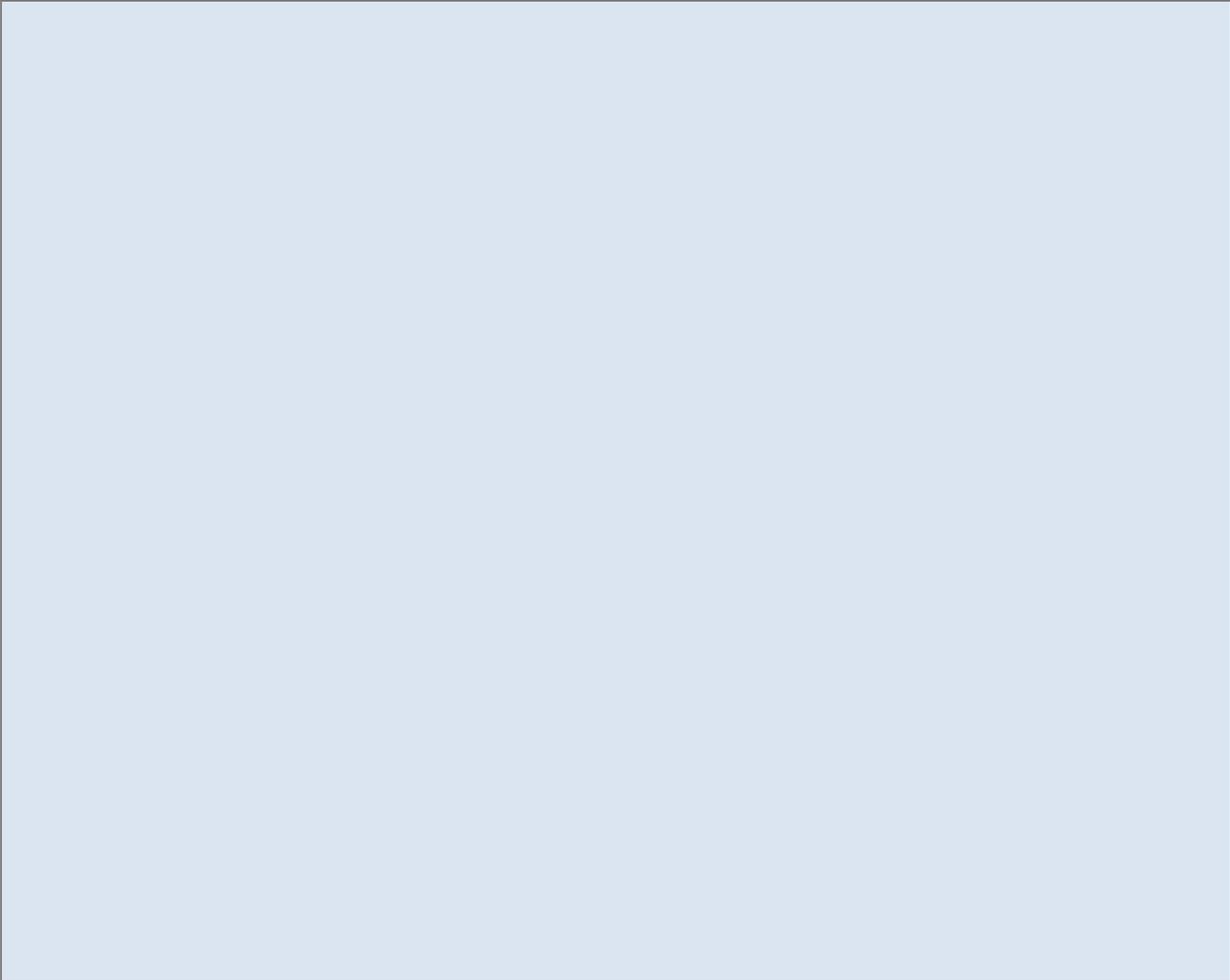
A. Problem Statement: Which regional labor market need from *Attachment A: Problem Statements* does your college propose to address? Select only one.

PLEASE NOTE: Additional sectors will be added to the RFA once the sector profile and strategy have been presented to the Workforce Development Council.

- Health
- Advanced Manufacturing
- ICT & Digital Media
- Business
- Life Sciences and Biotechnology

B. Curriculum Alignment: As mentioned in *Section II*, colleges must demonstrate that their curriculum is in alignment with the sector's KSAs before implementing a project or intervention for the sector. The steps for curriculum alignment have been provided in *Section II*. However, if your college prefers to *not* complete a curriculum alignment project, then describe how your curriculum is currently aligned with the KSAs identified in Attachment A. If your college *does* plan to conduct a curriculum alignment project, then enter "N/A" for this question.

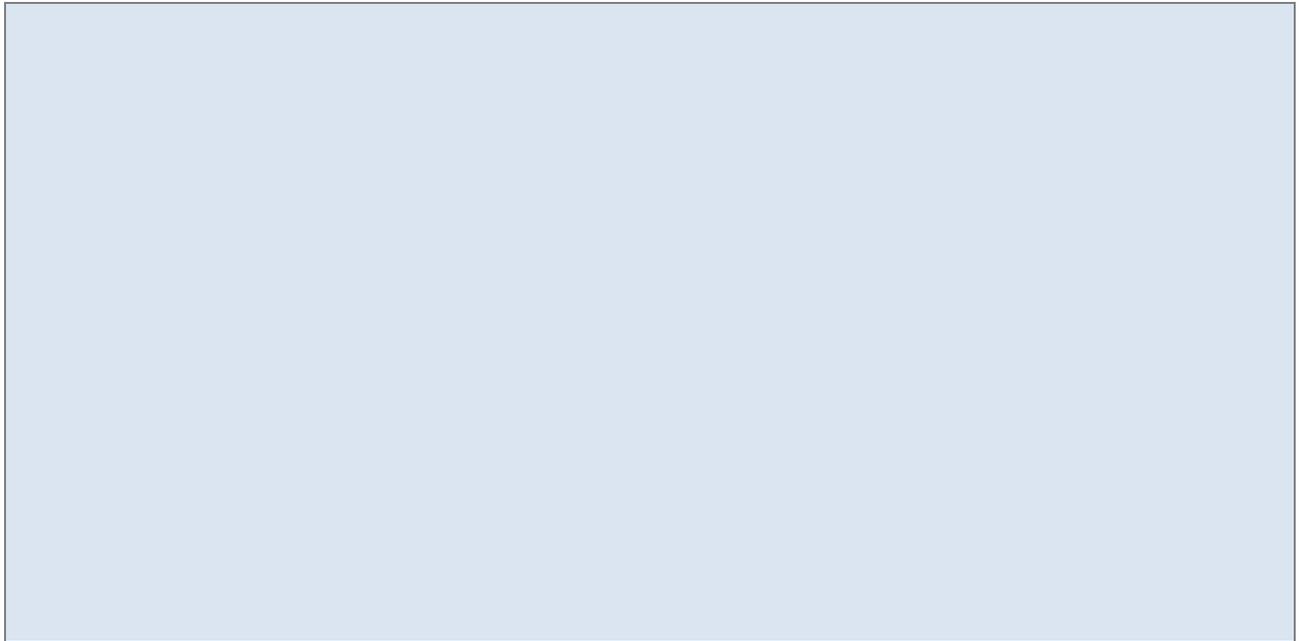
C. Description of Proposed Project: What intervention or project does your college propose to implement? How will you address the needs as described in the problem statement? What will change at your college? What will be developed? How will your project improve the SWP metrics (Refer to *Attachment A* for possible interventions, if needed)?



Section V: RFA Response Form

Instructions: Fill in the fields below with the appropriate information; however, this form will not be finalized until **after** the consultation meeting(s) with the Regional Consortium. This form will be used for the SWP workplan in [NOVA](#) and the contract scope of work with the Regional Consortium.

- A. Target Population:** Which population(s) will you target with this project? How will they benefit? For example, are certain demographics (e.g., age, gender, ethnicity) disproportionately enrolling, completing, and/or succeeding in your programs?



B. Major Outcomes or Leading Indicators: What indicators or outcomes (e.g., college action plans completed) will you track to assess the efficacy of your intervention? What are the goals and intended outcomes of your intervention?

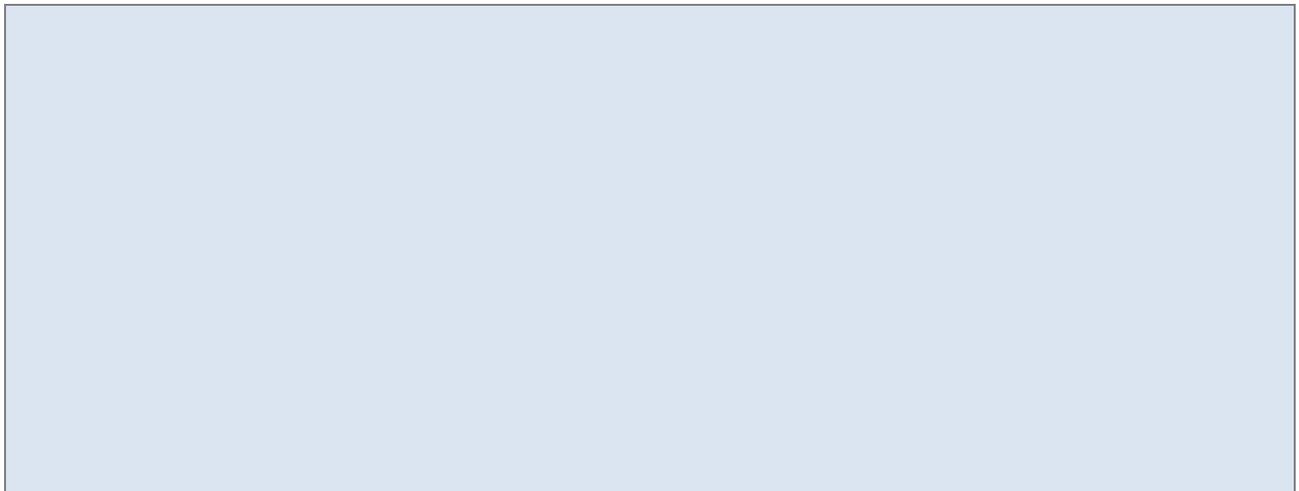
C. Metrics: Which SWP metric(s) do you expect to impact with your proposed project or intervention? Provide the baseline and baseline year. For metrics that do not apply, put “N/A.”

| Metric | Baseline | Baseline Year |
|--|----------|---------------|
| Number of Enrollments | | |
| Course Retention | | |
| Course Success | | |
| Students Who Earned 9+ Units in a Year | | |
| Number of Students Who Achieved a Noncredit Milestone | | |
| Number of Students Who Got a Degree, Certificate, or Apprenticeship Journey Status | | |
| Number of Students Who Transferred | | |
| Job Placement | | |
| Percentage Who Attained a Living Wage | | |

D. Implementation and Sustainability: How will you ensure ongoing implementation beyond the period of performance of this funding? How will you examine the ongoing effectiveness of your intervention or project?



E. Investment Plan: How will you use the funding? How you will leverage additional resources to accomplish your project goals? (For example, “The college will use local SWP funds to market our programs to increase enrollments and use regional SWP funds to increase capacity by...” Refer to the itemized list of budgeted expenses on the following page, when necessary, to describe your investment plan.



F. Budget: Colleges must submit a detailed budget describing how the proposed intervention will move the metrics. Provide a detailed budget for each year below. This funding is only available through December 2021 (exact dates will be released by the fiscal agent).

Year 1 Budget: January 1, 2021 - December 30, 2021

| Object | Classification | Itemized List of Budgeted Expenses | Total |
|------------------------------|---------------------------------------|---|--------------|
| 1000 | Instructional Salaries | | |
| 2000 | Non-instructional Salaries | | |
| 3000 | Employee Benefits | | |
| 4000 | Supplies and materials | | |
| 5000 | Other Operating Expenses and Services | | |
| 6000 | Capital Investment* | | |
| Total Program Costs** | | | |

*Colleges should not use regional SWP funds for 6000 unless there is a sustainability plan (e.g., sustained with local funds). Using funding for Capital Investment would only be appropriate to establish a classroom space for a new program or to increase capacity of an existing program.

**Indirect is not permitted on this project.

G. Signature Page

Career Education Dean

Signature

Date

First and Last Names (Printed)

Title

Chief Instructional Officer

Signature

Date

First and Last Names (Printed)

Title

College President

Signature

Date

First and Last Names (Printed)

Title

Attachment A: Problem Statements and Possible Interventions (Sector Strategies)

This section provides an overview of the labor market challenges in our region’s Priority and Emerging Sectors—specifically those addressable by the San Diego and Imperial Counties Community Colleges. These problem statements and their possible interventions were crafted by the San Diego-Imperial Center of Excellence for Labor Market Research (COE) and the sectors’ respective Regional Directors for Employer Engagement (Regional Directors).

Your college may choose to address any **one** of the following sectors’ problem statements (or statements of need) to respond to in *Section IV: Letter of Intent*. **If you choose to address more than one sector with your intervention or project, then submit a separate letter of intent for each.**

Please note that this RFA will be amended to include more Priority and Emerging Sectors as the information becomes available.

1) HEALTH

Problem Statement

More than 15 educational institutions in the San Diego-Imperial region train for key health care positions such as *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants*. While there is a significant labor market supply gap for these occupations (a gap of approximately 1,019 job openings to be filled each year), their entry-level earnings are below the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 1).¹ Furthermore, with the exception of *Medical Assistants*, their median hourly earnings are also below the living wage.

Exhibit 1: Hourly Earnings by Occupation in San Diego County

| Occupational Title | Entry-Level Hourly Earnings | Median Hourly Earnings |
|--------------------|-----------------------------|------------------------|
| Home Health Aides | \$12.16 | \$13.83 |
| Medical Assistants | \$15.69 | \$17.88 |
| Nursing Assistants | \$13.58 | \$15.61 |

Yet six community colleges in the region offer training programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants*. These occupations are typically considered “pathway occupations” to higher paying health care positions such as *Licensed Vocational Nurses* or *Registered Nurses*. However, due to the limited number of clinical placement opportunities in the region (and throughout California), students have fewer opportunities to follow these traditional career pathways. As

¹ San Diego-Imperial Center of Excellence for Labor Market Research. *Sector Recommendation Brief: Health Care*. 2020.

a result, there is a need for an alternative pathway for students in programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants* and for existing workers in these positions.

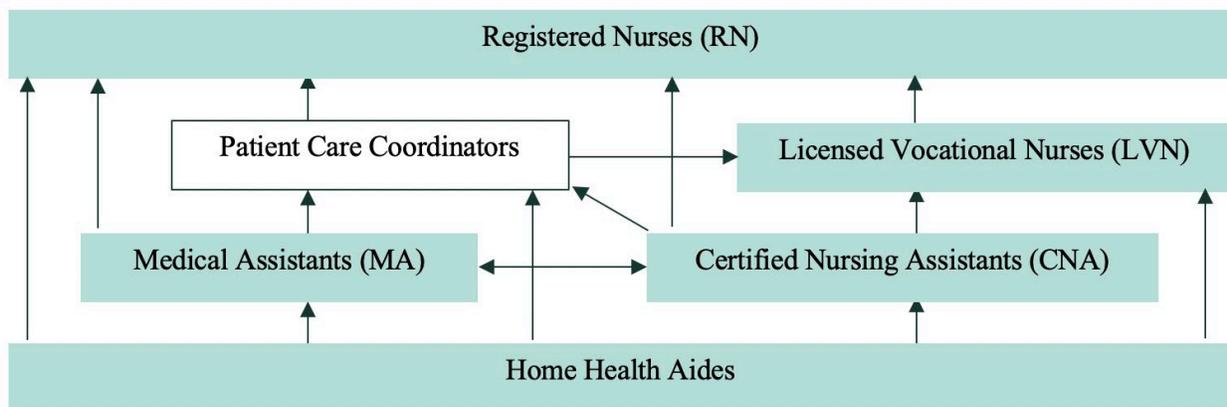
Possible Intervention: Expand Existing Programs to Include Patient Care Coordinators

Targeted colleges:

- Grossmont College
- Imperial Valley College
- MiraCosta College
- Palomar College
- San Diego Mesa College
- Southwestern College
- San Diego Continuing Education

After consulting employers, hosting focus groups, and analyzing online job postings, the COE and Regional Director recommend that colleges with programs for *Home Health Aides*, *Medical Assistants*, and *Certified Nursing Assistants* consider a career pathway for *Patient Care Coordinators*: Exhibit 2 provides a simplified career pathway diagram that includes *Patient Care Coordinators* as a potential next step for these positions.²

Exhibit 2: Simplified Career Pathway Diagram for Patient Care Coordinators



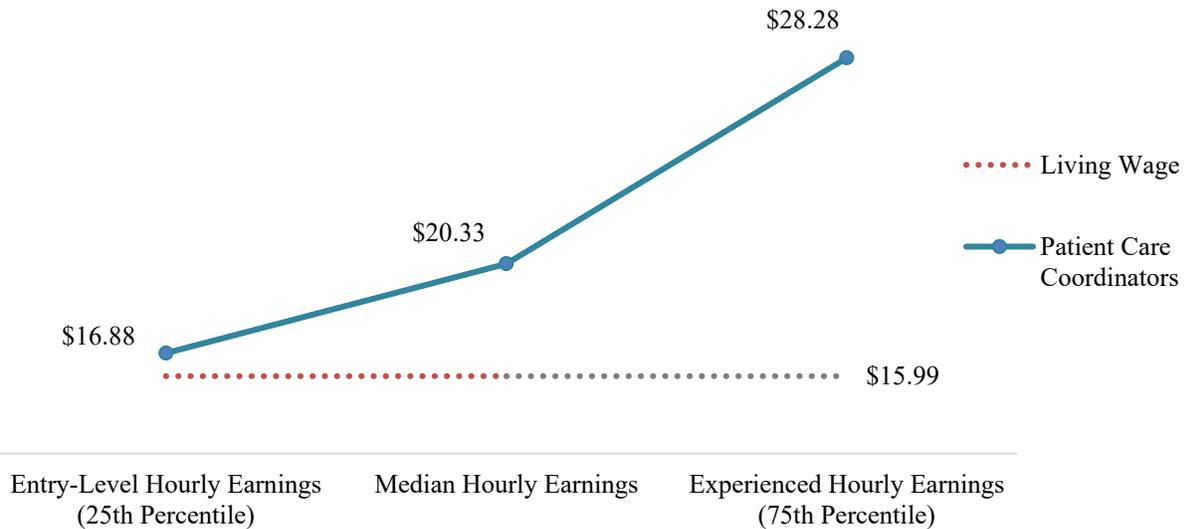
Patient Care Coordinators assess a patient’s “physical, social, psychological, and financial needs. They are often the first contact for provision of information to the patient or physician on behalf of attending physicians.”³ According to available labor market information, entry-level and median hourly wages for *Patient Care Coordinators* are \$16.88 and \$20.33, respectively—both are higher than the living wage (Exhibit 3).

² A more elaborate career pathway diagram is available in the full report: San Diego-Imperial Center of Excellence for Labor Market Research. *Sector Recommendation Brief: Health Care*. 2020.

³ healthcareersinfo.net/patient-care-coordinators

Additionally, employers posted more online job postings for *Patient Care Coordinators* in 2019 than in 2017, suggesting that there is an increased labor market demand for *Patient Care Coordinators* in the region.⁴

Exhibit 3: Hourly Earnings⁵ for *Patient Care Coordinators* in San Diego County, 2019⁶



Based on the knowledge, skills and abilities listed in those online job postings, **the region’s community colleges could offer the following courses for a *Patient Care Coordinators* program (Exhibit 4).** (If these courses currently exist, then the colleges could “repurpose” them for a *Patient Care Coordinators* program.)

⁴ Please keep in mind that online job postings are not as reliable as traditional labor market information. Employers tend to post more frequently for occupations that they have difficulty filling, which can result in overestimated numbers for online job postings.

⁵ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁶ Burning Glass Technologies, “Labor Insight Real-Time Labor Market Information Tool.” 2019.

Exhibit 4: Potential Courses for *Patient Care Coordinators*

| Prospective Course Title | Description |
|---|--|
| Introduction to Public Health / Social Determinants of Health | <ul style="list-style-type: none"> • Identify social determinants of health that affect chronic diseases |
| Motivational Interviewing | <ul style="list-style-type: none"> • Assist with behavioral change to set goals toward a healthier life style • Identify unhealthy behaviors |
| Chronic Diseases and Management of Chronic Conditions | <ul style="list-style-type: none"> • Learn about chronic health issues, environmental conditions, mental health challenges (e.g., stress, anxiety, fear), etc. |
| Health Care System | <ul style="list-style-type: none"> • Understand private health care, Medical, Medicare, and other programs that exist • Understand billing, coding, etc. • Navigate the health care system to make better referrals |
| Cultural Competency and Patient Advocacy (Communication Skills) | <ul style="list-style-type: none"> • Develop critical thinking skills to resolve problems between patients and providers • Learn verbal and written communication skills specific to the health care sector • Learn how to communicate with people from different backgrounds and how to advocate on behalf of people from different cultures |
| Organizational Skills and Computer Skills | <ul style="list-style-type: none"> • Develop Microsoft Office Suite skills (e.g., Microsoft Word, Microsoft Excel, Microsoft Outlook) |

2) ADVANCED MANUFACTURING

Problem Statement

Now more than ever, companies need industrial automation to be resilient in the post-pandemic world.⁷ *Industrial Automation Careers* deal with automation, robotics, and mechatronics. As the use of robots increases in manufacturing production and distribution, employers will need professionals who can work with, train and troubleshoot robots.⁸

Between 2019 and 2024, *Industrial Automation Careers* are projected to increase by 992 net jobs or four percent in San Diego County⁹ and 36 net jobs or four percent in Imperial County¹⁰. Not only are they in demand, *Industrial Automation Careers*’ entry-level and median earnings are above the living wage (Exhibit 5) and employers typically require an associate degree for these positions, making them an excellent fit for the San Diego and Imperial Counties Community Colleges to provide training.

Exhibit 5: Hourly Earnings for *Industrial Automation Careers* in San Diego County¹¹

| Occupational Title | Entry-level Hourly Earnings (25 th Percentile) | Median Hourly Earnings |
|---|---|------------------------|
| Electrical and Electronics Repairers, Powerhouse, Substation, and Relay | \$43.36 | \$53.03 |
| Industrial Engineering Technicians | \$28.30 | \$34.27 |
| Electrical and Electronics Repairers, Commercial and Industrial Equipment | \$26.80 | \$30.90 |
| Electrical and Electronics Engineering Technicians | \$26.34 | \$33.14 |
| Electrical and Electronics Installers and Repairers, Transportation Equipment | \$24.68 | \$27.50 |
| Industrial Machinery Mechanics | \$23.25 | \$27.82 |
| Electro-Mechanical Technicians | \$21.96 | \$28.52 |
| Mechanical Engineering Technicians | \$20.40 | \$26.96 |
| Installation, Maintenance, and Repair Workers, All Other | \$16.47 | \$20.59 |
| Maintenance and Repair Workers, General | \$15.86 | \$19.78 |

⁷ bcg.com/industries/engineered-products-infrastructure/center-digital-machinery/default

⁸ www2.deloitte.com/us/en/pages/manufacturing/articles/future-of-manufacturing-skills-gap-study.html

⁹ coeccc.net/reports/Industrial_Automation_Occupations

¹⁰ coeccc.net/reports/Industrial_Automation_Occupations_Imperial_County

¹¹ Imperial County-specific wages could be found at coeccc.net/reports/Industrial_Automation_Occupations_Imperial_County

Possible Intervention: Expand Existing Programs to Include Skills and Competencies Required in Industrial Automation Careers

Targeted colleges:

- Cuyamaca College
- Grossmont College
- MiraCosta College
- Imperial Valley College
- Palomar College
- San Diego City College
- San Diego Continuing Education
- Southwestern College

Comparing labor market demand with supply, the San Diego-Imperial COE found a supply gap of 2,461 awards for San Diego County¹² and 47 for Imperial County¹³. In order to address the supply gap for these occupations, **the region’s community colleges could implement an *Industrial Automation and Maintenance Program***. This program will prepare students for fields such as engineering technology, electrical technology, industrial technology, operational technology, sensor technology, automation technology, robotics and mechatronics. This can be accomplished by expanding existing programs or creating new programs in the region. According to Taxonomy of Programs (TOP) data, four community colleges currently supply the region with awards for *Industrial Automation Careers* (Exhibit 6).

Exhibit 6: Colleges with Programs (TOP Codes) for *Industrial Automation Careers*

| TOP Code and Title | College |
|---|---|
| 0934.00 Electronics and Electric Technology | <ul style="list-style-type: none"> • Imperial Valley • San Diego City • San Diego Continuing Education |
| 0934.10 Computer Electronics | <ul style="list-style-type: none"> • San Diego City • San Diego Continuing Education |
| 0934.40 Electrical Systems and Power Transmission | <ul style="list-style-type: none"> • San Diego City |
| 0935.00 Electro-Mechanical Technology | <ul style="list-style-type: none"> • Cuyamaca |
| 0956.00 Manufacturing and Industrial Technology | <ul style="list-style-type: none"> • San Diego City • San Diego Continuing Education |
| 0999.00 Other Engineering and Related Industrial Technologies | <ul style="list-style-type: none"> • San Diego City |

¹² coecc.net/reports/Industrial_Automation_Occupations

¹³ coecc.net/reports/Industrial_Automation_Occupations_Imperial_County

Industrial Automation Careers generally require the following KSAs (Exhibit 7). At minimum, the San Diego and Imperial Counties Community Colleges should incorporate these KSAs into their existing programs.

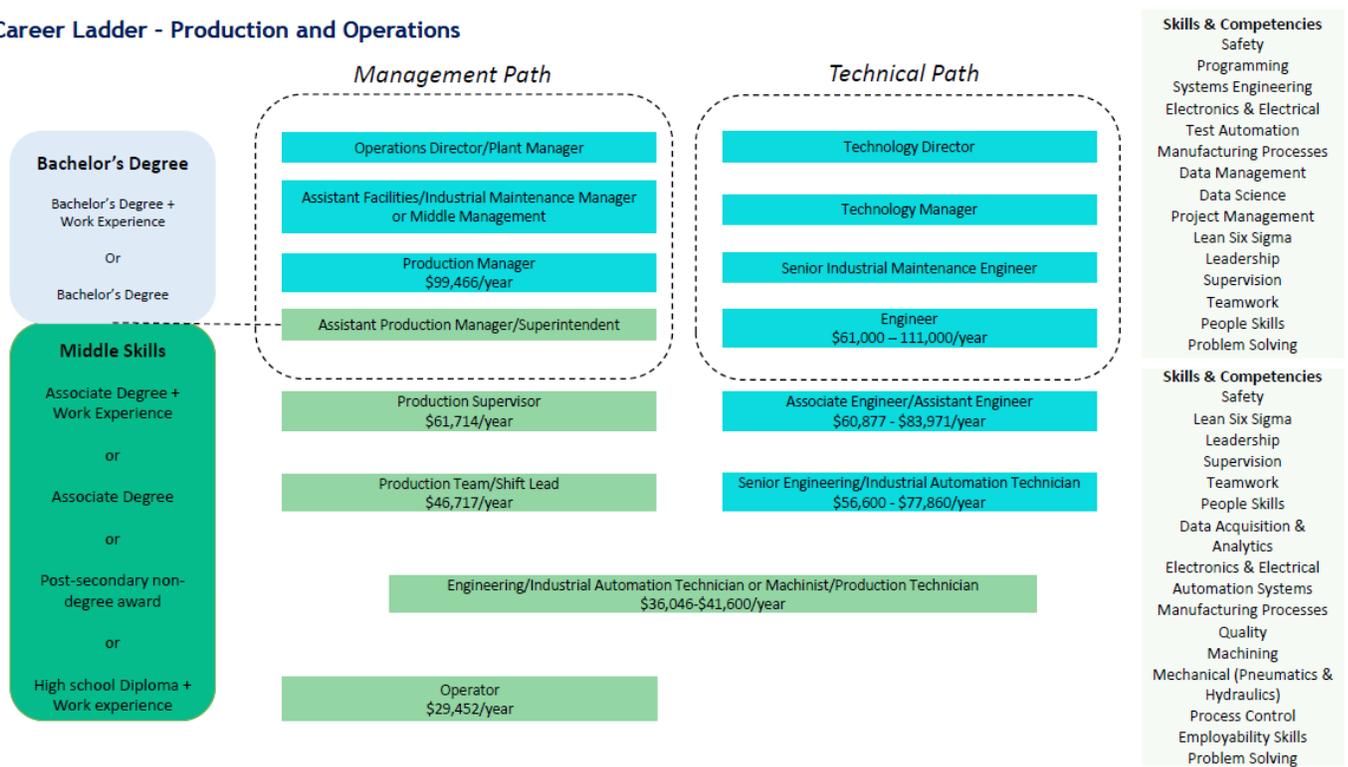
Exhibit 7: Knowledge, Skills and Abilities for *Industrial Automation Careers*¹⁴

| | |
|------------------------------|--------------------------------------|
| Data Acquisition & Analytics | Machining |
| Electronics & Electrical | Mechanical (Pneumatics & Hydraulics) |
| Automation Systems | Process Control |
| Manufacturing Processes | 21st Century Employability Skills |
| Quality | |

More specifically, *Industrial Automation Careers* have two types of career pathways that the community colleges could focus on: 1) Production and Operations and 2) Maintenance and Operations (Exhibit 8).

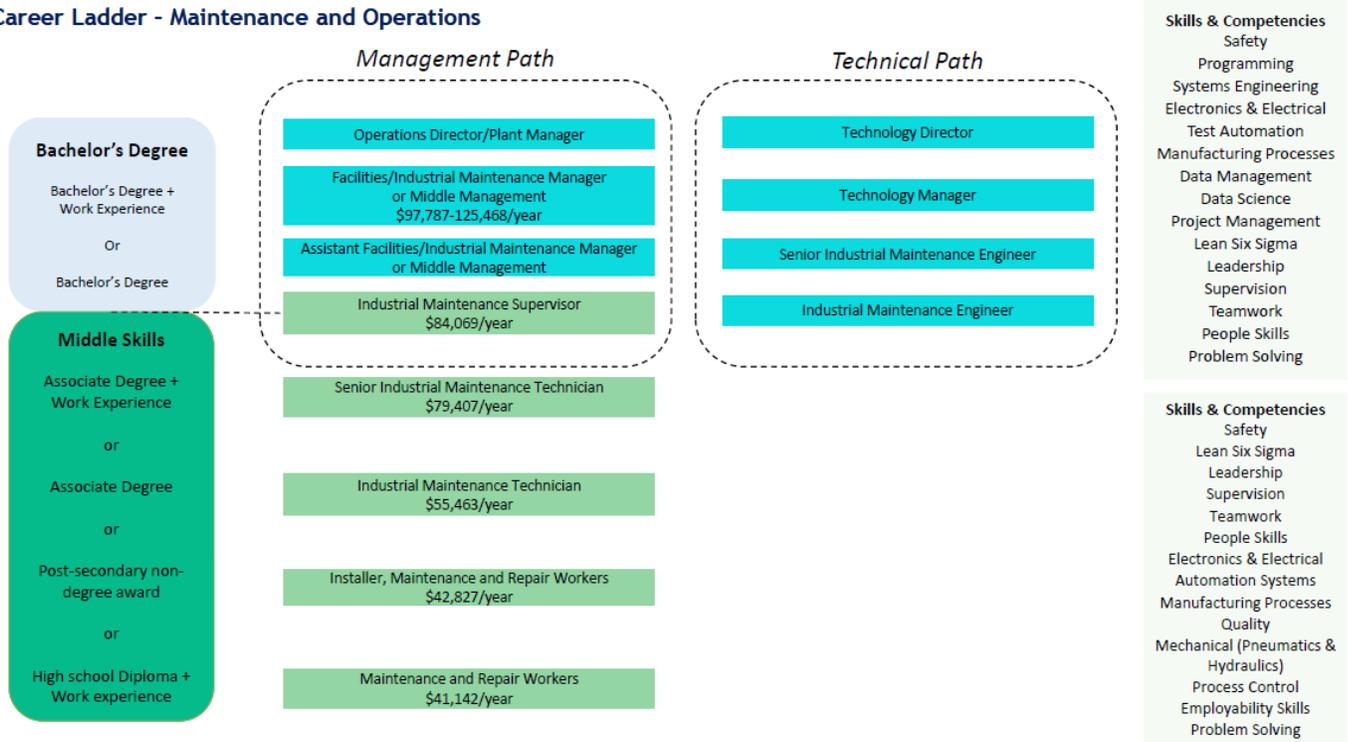
Exhibit 8: Career Pathways for *Industrial Automation Careers*

Career Ladder - Production and Operations



¹⁴ amatrol.com/wp-content/uploads/2020/02/CH-23-H-Advanced-Manufacturing-Chart-Interactive-PDF.pdf
coecc.net/reports/Industrial_Automation_Occupations

Career Ladder - Maintenance and Operations



3) ICT & DIGITAL MEDIA

Problem Statement

There is significant labor market demand for ICT and Digital Media professionals, specifically in programming, systems administration/networking (“tech forest”)¹⁵, and cybersecurity¹⁶. These “behind-the-screen” positions pay well—in many cases, 2 to 4 times the living wage. However, challenges exist in training for “behind-the-screen” positions: Employers frequently require more than an associate degree to enter and/or advance in these fields and much attention has been paid to train workers in business software applications (termed “Business Information Worker” or BIW) and web development due to the ease in developing such programs. These “in-front-of-the-screen” opportunities represent about more than 75% of positions in this sector but tend to offer lower wages than “behind-the-screen” positions (Exhibit 9). Digital media salaries are negatively impacted by oversupply and data is convoluted as this skill set is increasingly becoming part of other job titles (i.e., content creation/editing may be required as part of a “graphics designer” position).

Exhibit 9: Hourly Earnings by Occupation in San Diego County¹⁷

| Occupational Title | Sub-sector | Median Hourly Earnings |
|---|---------------------------|------------------------|
| Information Security Analyst | Cybersecurity - behind | \$46.84 |
| Computer User Support Specialist | “Tech forest” - behind | \$28.19 |
| Web Developer | Programming - behind | \$26.39 |
| Software Developers - Applications | Programming - behind | \$53.21 |
| Secretaries and Administrative Assistants | Business software - front | \$19.66 |
| Multimedia Artists and Animators | Digital media - front | \$26.40 |

The greatest opportunity, in terms of job quantity and earnings, exists in “behind-the-screen” professions. Software development (as part of Associate Degree for Transfer or ADT in Computer Science) or stand-alone is the largest unfulfilled need followed by cybersecurity.¹⁸ All colleges offer some programming courses but not all languages are equally in demand. A recent San Diego Regional EDC report, Demand for Software Talent, identified python, JavaScript, Java, SQL, C++, C# and C as high-demand languages (in addition to other skills such as version control and agile methodology).¹⁹ Of note, Visual Basic, Ruby, PHP and Fortran are missing from this list but continue to be offered at several colleges to some degree.

¹⁵ coeccc.net/reports/Information_Technology_Administrators and coeccc.net/reports/Computer_User_Support_Specialists

¹⁶ coeccc.net/reports/Information_Security_Analysts

¹⁷ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

¹⁸ WestEd analysis of LaunchBoard and EMSI data estimates public regional community colleges will supply 14% of regional demand for software developers and 14% of networking/cybersecurity specialists (mid-college prep) over the next 3 years

¹⁹ arcgis.com/apps/Cascade/index.html?appid=36ef8f3e9881417f87edfeae537e66

All 10 public community colleges offer business software applications (BIW) and digital media programs, despite an overrepresentation of digital media and entertainment relative to job opportunities. For cybersecurity, industry certifications are highly valued, perhaps more than university degrees. As such, the focus should be on courses and programs that cover similar, if not identical subject matter content as mainstream in-demand certifications from Cisco, CompTIA, EC-Council, ISACA and (ISC)² (Exhibit 10). For a clearer understanding of the knowledge, skills, and abilities needed for careers in ICT/DM, see Exhibit 11.

Exhibit 10: Major Industry Cybersecurity Certifications

| Organization | Certification | Demand | |
|--------------------|--|---------------------|---------|
| | | Jobs ⁽¹⁾ | Percent |
| CompTIA | Security+, CySA+, PenTest+, CASP+ | 2,325 | 79% |
| Cisco | CCNA, CCNP, CCIE | 214 | 7% |
| (ISC) ² | CISSP, CCSP | 154 | 5% |
| AXELOS | ITIL | 98 | 3% |
| ISACA | CISA, CISM | 90 | 3% |
| SANS | GIAC – (GSEC, GSNA, GICSP, GCIH, GCFA, GCED, GCIA) | 33 | 1% |
| EC-Council | Certified Ethical Hacker (CEH), CHFI, ECSA | 22 | 1% |

Exhibit 11: Knowledge, Skills, Abilities for Success by Subsector

| Business Software Applications | IT Networking/Cybersecurity | Computer Science / Software Development | Digital Media / Entertainment |
|--|--|--|--|
| Business Communications & Computer Literacy | A+ (or comparable hardware) (esp. retail) | CS-ADT | Graphic Design (Adobe - Photoshop, Illustrator, InDesign, Animate) |
| MS Office (Word, Powerpoint, Excel, Outlook) | Help desk / troubleshooting | C++, python, Java, Javascript + node.js | Video/Audio Production |
| Excel (pivot tables) or Google Docs | CISCO (or comparable) certification | Linux, Windows Server (certification valued but not without degree) | Photography |
| Quickbooks | Security+, CySA+, CISA, CISSP certifications | RDBMS (MySQL, MS SQL Server, Oracle) NoSQL (mongo, couchdb); graph db (e.g. Neo4j) for GIS | Writing / storytelling / journalism |
| Business math | Linux & Open source security tools (e.g. Kali) | Scripting (bash or Powershell) | [Web] Publishing |
| Salesforce (CRM) | Scripting (bash) | Debugging; Frameworks - AngularJS, React | Social media |

Possible Intervention:

Targeted colleges (based on lack of submissions to prior ICT RFA):

- Grossmont College
- Cuyamaca College
- Imperial Valley College
- Palomar College
- Southwestern College

Colleges should, possibly as part of a periodic internal program review, evaluate their offerings in terms of languages, ancillary skills and overall demand, based on labor market information. In addition to current trends, the language “lifespan” should be considered based on existing code that needs supported/rewritten and, for newer languages and/or frameworks, industry backers. The ecosystem size is a proxy for short-term employment opportunities and existing code base will affect long-term prospects. Existing programs without strategic value and where graduates cannot find gainful employment should be discontinued or modified to align to industry needs with a commitment by faculty and by colleges to fund professional development; and participate in meaningful industry engagement. For software development increased focus on upskilling pathways (either through increased coordination with K-12 partners or marketing to incumbent workers) and creation of better marketing collateral, highlighting the ADT career pathways are recommended.

In the area of cybersecurity, a comprehensive review of the student learning outcomes (SLO) entries on all courses in a program leading to a certificate or degree for contrast with exam objectives associated with industry certifications would create a framework for curriculum alignment with industry needs. Once missing components are identified, refined programs may be presented, if needed, for approval. Concurrent to the availability of modern cybersecurity programs, a subsidized funding source for industry certifications is advised as typical cost is \$150-\$400, which may be out of reach for most college students. Finally targeted marketing to incumbent workers is an untapped market due to the certification expirations. A side benefit will be the positioning of regional public community colleges as authoritative organizations for cybersecurity training.

A survey of security program syllabi for SLO that align with certification objectives would be required to assess what modifications would be required to adequately prepare students for jobs in cybersecurity. As industry needs evolve, a static certification holds limited value therefore these certifications must be renewed every 2-3 years or require an addition of continuing education credits.

4) BUSINESS AND ENTREPRENEURSHIP

Problem Statement

Business and Entrepreneurship continues to be not only a popular decision for students but a crucial part of the economy in San Diego. In their recent Resilient Jobs Report²⁰, the San Diego-Imperial Center of Excellence for Labor Market Research reported: (1) of the top 100 middle-skill jobs, 22 are in the business sector, (2) of the top 64 recession-resilient jobs, 11 are in the business sector, and (3) of the 66 pandemic-resilient jobs, 23 are in the business sector. Although all ten colleges in the Region are training for business careers (Exhibit 12) and there are a lot of jobs in the business sector, there are still challenges that can be mitigated to more fully support industry and better prepare students.

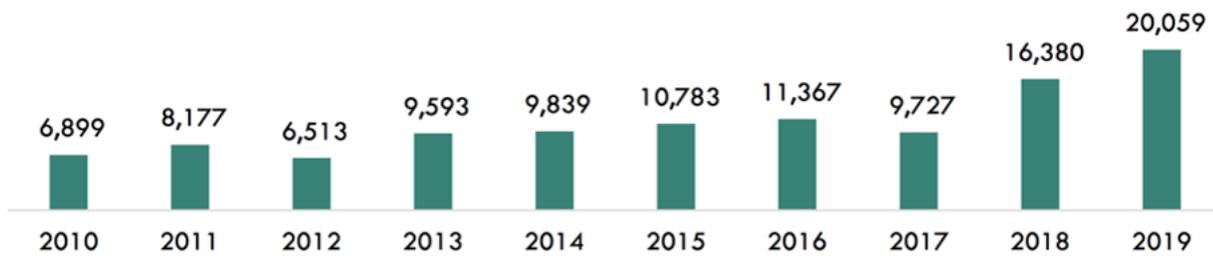
Exhibit 12: Business Programs by TOP Code in San Diego and Imperial County

| TOP6 | TOP6 Program Title | # Programs & Courses |
|---------|--|----------------------|
| 0514.00 | Office Technology/Office Computer Applications | 64 |
| 0514.10 | Legal Office Technology | 32 |
| 0505.00 | Business Administration | 25 |
| 0506.00 | Business Management | 20 |
| 0511.00 | Real Estate | 17 |
| 0509.00 | Marketing and Distribution | 10 |
| 0506.50 | Retail Store Operations and Management | 9 |
| 0506.30 | Management Development & Supervision | 3 |
| 0509.40 | Sales and Salesmanship | 1 |

1. Data suggests there is a shortage of Management and Sales programs. According to data pulled from COCI, the Region only has 3 management programs and 1 sales program, despite the data suggesting these are both high demand areas (Exhibit 13).
2. Students need clearer and simplified pathways. In many cases, courses and degrees which train for the same occupations have different course titles and names at each college. Considering the volume of business programs in the Region, this makes it confusing for students.
3. Despite Entrepreneurship programs being at each of the colleges, not all of them are listed in the curriculum inventory and can be difficult to find. These entrepreneurship programs have an opportunity to be cross sector and targeted to help meet specific needs in the local community.

21. Resilient Jobs Report. San Diego-Imperial Center of Excellence for Labor Market Research. 2020. https://myworkforceconnection.org/wp-content/uploads/2020/08/Resilient-Jobs_2020-08-27v4.pdf

Exhibit 13: Number of Online Job Postings for Sales Occupations in San Diego County (2010-2019)

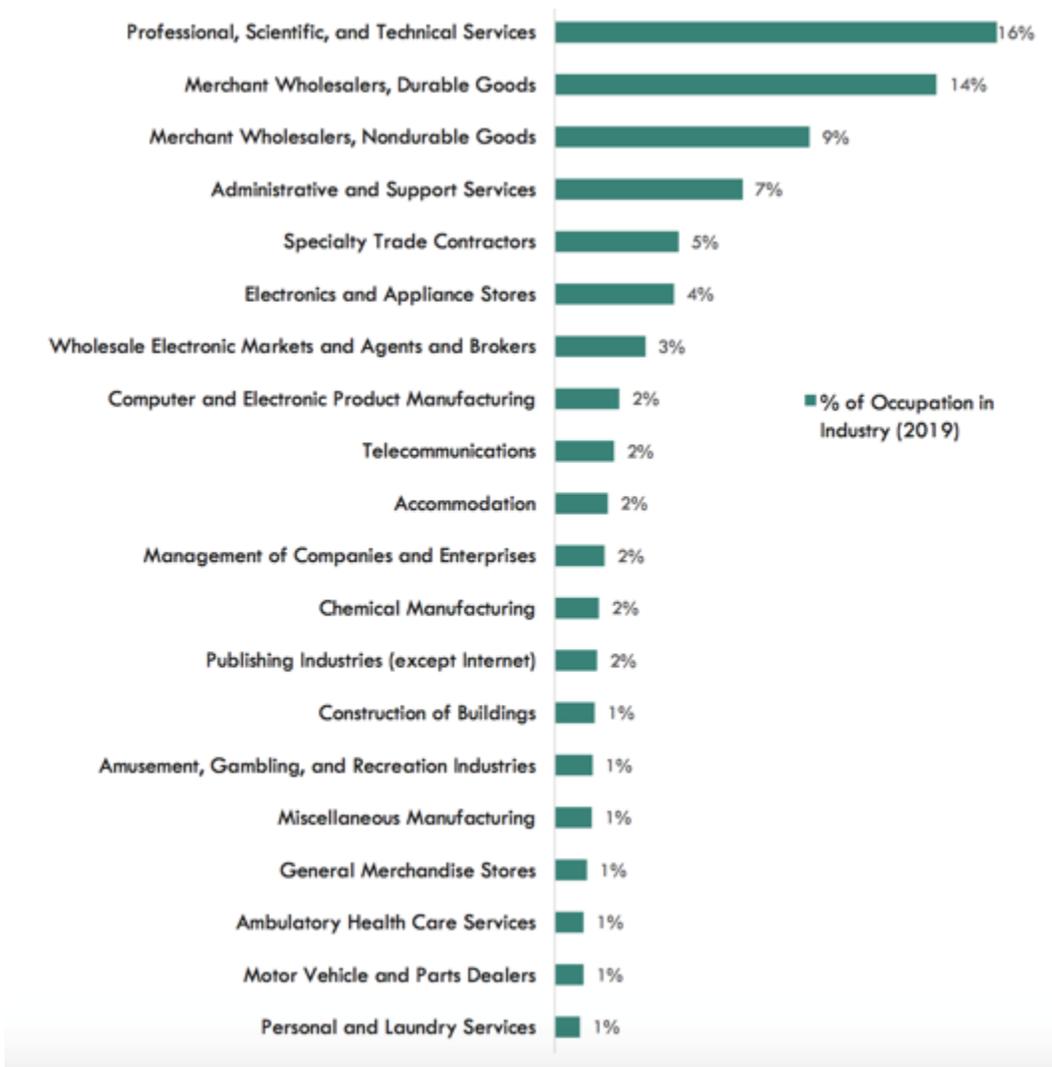


Possible Interventions:

1. Colleges should create an inventory of all Business, Management, Sales and Entrepreneurship offerings by course and degree. This will provide a better understanding of the programs not represented in COCI and provide a clearer picture for possible curriculum modifications. Through these modifications or updates, colleges should consider creating stackable options for students, specifically targeting noncredit or contract education.
2. Sales, management, entrepreneurship can all be specialized to offer cross-sector training and opportunities (Exhibit 3). Colleges should identify what other programs can benefit from courses in these areas and find ways to integrate these courses in to other programs.
3. Regionally participate in Communities of Practice for coordination, alignment of programs and clearer program naming. This will help students to better navigate different college programs. Once aligned regionally, targeted and possibly joint marketing campaigns can be developed around business programs.
4. Entrepreneurship Programs should seek to align with the LMI and with local communities. This targeted approach will allow colleges to determine what would be the best fit for students and small businesses or startups in the college's service area.
5. Market and publish programs and courses so students understand what they will be learning. In the Gig Economy Report²¹ it was conveyed that "Focus group participants in Imperial County recommended that Imperial Valley College rebrand existing business classes as "gig worker" classes. Participants said that they were well aware of the free classes offered for "businesses" at Imperial Valley College. Gig workers did not consider these classes relevant to them because they did not consider themselves to be businesses. Words such as "entrepreneurship" and "accounting" seemed intimidating or irrelevant to them as gig workers. They considered businesses to be companies with multiple employees, whereas they were single employees doing contract work. The participants suggested that a branding change is necessary to appeal to gig workers. IVC could offer courses in accounting or entrepreneurship, but they would need to be branded as courses in how to use the gig economy or how to run a second job in the gig economy."

22. Gig Economy- Imperial County. San Diego-Imperial Center of Excellence for Labor Market Research. 2019. https://myworkforceconnection.org/wp-content/uploads/2020/05/Gig-Economy-Study_Imperial-County_Full-Report_2019-10-29.pdf

Exhibit 14: Percentage of Sales Occupations Employed by Industry in San Diego County (2019)



5) LIFE SCIENCES-BIOTECHNOLOGY

Background and Problem Statements

The Life Sciences and Biotech sector accounts for 59,844 jobs in the San Diego-Imperial region and 17% of all Life Sciences and Biotech jobs in California. There are approximately 1,686 Life Sciences and Biotech establishments in San Diego County, making up 13% of California’s Life Sciences and Biotech businesses. The sector is projected to grow over 7% (or 3,950 jobs) in the next five years in both San Diego and Imperial Counties. The average earnings per Life Sciences & Biotech job is \$161,080.²²

Life Sciences and Biotechnology occupations can be categorized into two groups: middle-skill jobs and pathway jobs. Middle-skill jobs are occupations that community college students would be best prepared for after obtaining a certificate or degree. Middle-skill jobs are also known as “technician-level” jobs. Pathway jobs require at least a bachelor’s degree or higher. Although many students find work without advanced degrees, many **employers still prefer candidates with more than a community college award.**

Top middle-skill jobs are defined as occupations with the most labor market demand, stable employment growth, and entry-level wages at or above the Self-Sufficiency Standard.²³ Comparing labor market demand with program supply suggests that the **top middle-skill jobs in this sector have supply gaps in San Diego County.** Labor market demand is defined as the number of average annual job openings per year that employers expect to fill for a particular occupation. Program supply is the number of awards (e.g., degrees, certificates) from the community colleges and non-community college providers.

²² Sector Analysis Highlights, Life Sciences-Biotechnology, <https://coecc.net>, 2019

²⁴ The Self-Sufficiency Standard is the hourly wage that a single adult needs to earn to meet basic needs in San Diego County. selfsufficiency.org. Individuals at the 25th percentile earn entry-level wages, while individuals at the median level earn median wages due to a more experience, more training, etc.

Exhibit 15: Middle-Skill Jobs Attainable with a Community College Education

Middle-Skill Jobs Attainable with a Community College Education, San Diego-Imperial Region (2018-2023)

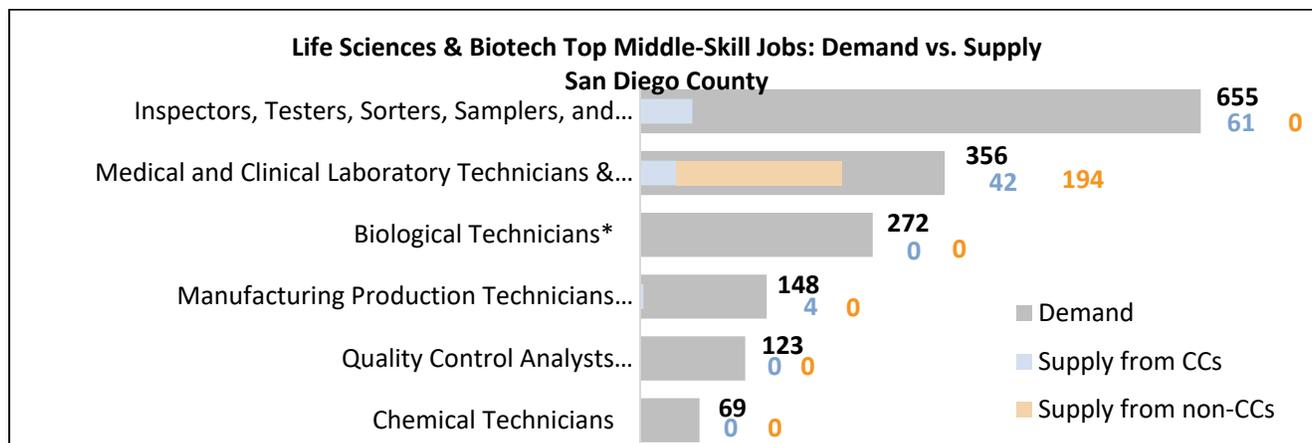
| Occupational Title | Annual Job Openings (Demand) | Entry-Level ² Hourly Earnings | Median Hourly Earnings |
|---|------------------------------|--|------------------------|
| Inspectors, Testers, Sorters, Samplers, and Weighers | 616 | \$14.38 | \$19.02 |
| Clinical Laboratory Technologists and Technicians | 318 | \$17.34 | \$25.91 |
| Biological Technicians | 293 | \$19.82 | \$24.22 |
| Manufacturing Production Technicians* and Manufacturing Engineering Technologists* (part of Engineering Technicians, Except Drafters, All Other) ³ | 192 | \$26.30 | \$33.17 |
| Quality Control Analysts* (part of Life, Physical, and Social Science Technicians, All Other) | 132 | \$19.00 | \$26.01 |
| Chemical Technicians | 74 | \$17.14 | \$22.62 |

Exhibit 16: Pathway Jobs

Pathway Jobs, San Diego-Imperial Region (2018-2023)

| Occupational Title | Annual Job Openings (Demand) | Entry-Level Hourly Earnings | Median Hourly Earnings |
|--|------------------------------|-----------------------------|------------------------|
| First-Line Supervisors of Production and Operating Workers | 475 | \$22.23 | \$29.67 |
| Compliance Officers (includes Regulatory Affairs Specialists) | 453 | \$28.86 | \$39.51 |
| Sales Representatives, Wholesale & Manufacturing, Technical & Scientific Products | 430 | \$23.00 | \$32.49 |
| Medical Scientists, Except Epidemiologists | 393 | \$37.39 | \$49.31 |
| Manufacturing Engineers*, Biochemical Engineers*, and Validation Engineers* (part of Engineers, All Other) | 213 | \$36.72 | \$48.54 |
| Chemists | 135 | \$26.00 | \$34.89 |
| Biological Scientists, All Other | 125 | \$31.98 | \$39.98 |
| Biochemists and Biophysicists | 109 | \$34.99 | \$43.71 |
| Laboratory Managers* and Clinical Research Coordinators* (part of Natural Sciences Managers) | 101 | \$55.55 | \$68.39 |
| Biostatisticians* and Clinical Data Managers* (part of Statisticians) | 82 | \$39.50 | \$50.82 |
| Biomedical Engineers | 78 | \$31.86 | \$54.31 |
| Microbiologists | 65 | \$33.65 | \$44.44 |

Exhibit 16: Top Middle-Skill Jobs Demand vs. Supply



The asterisk (*) above indicates that four top middle-skill jobs (Inspectors, Testers, Sorters, Samplers and Weighers; Biological Technicians; Manufacturing Production Technicians; and Quality Control Analysts) have the same Taxonomy of Programs (TOP)²⁴ code, Biotechnology and Biomedical Technology (TOP 043000). TOP 043000 supplies only 61 awards,²⁵ but trains for four different occupations with a total labor market demand of 1,198 annual openings, **suggesting a supply gap of 1,137 awards.**

Key Findings and Recommendations

The research objectives were to identify labor market supply gaps in middle-skill jobs; understand where programs exist or do not exist to fill in the supply gaps; and discuss how the region's community colleges could close the supply gaps. The following summarizes the findings and recommendations for the Life Sciences and Biotechnology sector.

- 1. Enrollment numbers are low for existing programs:** While there is high labor market demand, few students enroll in existing Life Sciences and Biotechnology programs. Furthermore, there are not a significant number of K-12 programs that prepare students for postsecondary Life Sciences and Biotechnology programs.

⇒ To increase enrollment numbers, the colleges should conduct a marketing campaign that educates K-12 students about career and coursework opportunities in Life Sciences and Biotechnology. The colleges should also work with middle school and high school counselors, faculty, and other stakeholders to encourage students to enroll in existing community college programs if their interests and strengths align with the sector's jobs. This includes strategies for dual enrollment, articulation agreements, and early work-based

²⁵ Other Engineering and Related Industrial Technologies (TOP 099900) also trains for Manufacturing Production Technicians and provides 4 awards in the region. However, TOP 099900 is a general.

²⁵ TOP code and trains for multiple occupations; therefore, it was removed from the supply analysis. TOP is a system of numerical codes used at the state level to collect and report information on community college programs and courses throughout the state that have similar outcomes.

learning opportunities. For our incumbent workforce, coursework logistics and scheduling strategies that provide increased course availability for working individuals should be implemented to maximize equity. Examples include optimized AM/PM scheduling, cohort tracks, compressed and hybrid course offerings.

- 2. The sector has large labor market demand, but small program supply:** Programs such as Biotechnology and Biomedical Technology (TOP 043000) have large supply gaps and small completion numbers.

⇒ To increase retention and success of students in Life Sciences and Biotechnology, programs for this sector should develop training strategies that include multiple semester offerings, compressed coursework, and cohort scheduling. Correct implementation of these strategies should increase program enrollment, retention, completions, and reduce the regional labor market gap.

- 3. Developing programs south of Interstate 8 (I-8) is challenging to attract students:** Life Sciences and Biotechnology jobs and employers are primarily clustered around State Route 52 (SR 52) and SR 78. Students residing elsewhere in the region are not exposed to Life Sciences and Biotechnology companies and are unfamiliar with jobs in this sector.

⇒ To increase exposure to this sector, colleges south of the Interstate-8 should increase focus on proximal sector opportunities (i.e. Medical Laboratories, Food Sciences & Manufacturing, Environmental Chemistry) and create new strategies to increase sector advocacy and partnerships. Examples include increased training partnerships with medical laboratories, commercial fermentation companies, agriculture technology firms, and environmental chemistry agencies.

- 4. Employers are filling the middle-skill jobs gap with candidates who have bachelor's degrees or higher:** This leads to high turnover once an overqualified individual gets his/her “foot through the door” and moves on to higher positions.

⇒ Programs should develop pathways into specific bachelor's program in parallel with tailored work-based learning opportunities that support the working professional throughout the 4-year training model. Examples include: Pathways and 2+2 agreements into Mira Costa College Biomanufacturing, National University's Clinical Laboratory Sciences, CSU Global Quality Assurance, SDSU Chemistry.

Attachment B: Assessment/Analysis of Enrollment, Retention, Completion, Employment and Earnings of Students in Programs (Template)

Instructions:

1. For each metric (enrollment, retention, completion, employment, and earnings), use the following template and your college’s definition of these metrics to provide an assessment/analysis of your courses and department.
2. This template provides an example of how to analyze “enrollment” rates. Replace the grey-shaded font with the appropriate metric name when replicating this template for other metrics (retention, completion, completion, employment, and earnings).

[ENROLLMENT] RATES BY DEMOGRAPHIC

1. What are the **enrollment** rates for the community college overall, department, and course for each demographic below (i.e., race/ethnicity, gender, age group)?

| Race/Ethnicity | Community College Overall % | % of Students in Course | Department % |
|-------------------------------|-----------------------------|-------------------------|--------------|
| African American | % | % | % |
| American Indian/Alaska Native | % | % | % |
| Asian | % | % | % |
| Filipino/a | % | % | % |
| Hispanic | % | % | % |
| Pacific Islander | % | % | % |
| Two or More Races | % | % | % |
| White | % | % | % |
| Other, unreported or N/A | % | % | % |

| Gender | Community College Overall % | % of Students in Course | Department % |
|---------------------------|-----------------------------|-------------------------|--------------|
| Male | % | % | % |
| Female | % | % | % |
| Other, unreported, or N/A | % | % | % |

| Age Group | Community College Overall % | % of Students in Course | Department % |
|--------------------------|-----------------------------|-------------------------|--------------|
| 19 or younger | % | % | % |
| 20-24 | % | % | % |
| 25-29 | % | % | % |
| 30-34 | % | % | % |
| 35-39 | % | % | % |
| 40 and older | % | % | % |
| Other, unreported or N/A | % | % | % |

2. Based on the student demographic data for enrollment, retention, completion, completion, employment and earnings, answer the following open-ended questions.

- a. What trends do you see among the different demographics? Do certain demographics have higher rates in your courses or department than the college overall, depending on the metric? Why do you think these trends exist?

- a. Do you have any demographics with a high retention rate, but low success rate? Conversely, do you have any demographics with a low retention rate, but high success rate? If so, why do you think these trends exist?

- b. Are you interested in increasing the enrollment, retention, success, etc. rates of a specific demographic? If so, what would be your next steps?